Notice No.11

Rules and Regulations for the Classification of Naval Ships, January 2018

The status of this Rule set is amended as shown and is now to be read in conjunction with this and prior Notices. Any corrigenda included in the Notice are effective immediately.

Please note that corrigenda amends to paragraphs, Tables and Figures are not shown in their entirety.

Issue date: November 2018

Amendments to	**Effective date**	**IACS/IMO implementation (if applicable)**
Volume 1, Part 3, Chapter 5, Section 8 & 10	Corrigenda	N/A
Volume 1, Part 5, Chapter 3, Section 4	Corrigenda	N/A
Volume 2, Part 2, Chapter 1, Sections 3 & 7	Corrigenda	N/A
Volume 2, Part 9, Chapter 2, Scope	Corrigendum	N/A
Volume 2, Part 9, Chapter 3, Scope	Corrigendum	N/A
Volume 2, Part 9, Chapter 4, Scope	Corrigendum	N/A
Volume 2, Part 9, Chapter 6, Scope	Corrigendum	N/A
Volume 2, Part 9, Chapter 7, Scope	Corrigendum	N/A
Volume 2, Part 9, Chapter 8, Scope	Corrigendum	N/A
Volume 2, Part 10, Chapter 2, Scope	Corrigendum	N/A
Volume 3, Part 3, Chapter 2, Section 2	Corrigendum	N/A

Lloyd's Register

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Volume 1, Part 3,
Chapter 5
Anchoring, Mooring, Towing, Berthing, Launching, Recovery and Docking

■ *Section 8*
Anchor windlass design and testing

8.2 Plans and particulars to be submitted

8.2.1 The following plans showing the design specifications, the standard of compliance, engineering analyses and details of construction, as applicable, are to be submitted for evaluation:

- Windlass foundation drawings ~~inclusive of~~ including the supporting structure below deck. The details shall include bolts, chocks, shear stoppers etc., along with the foot print loads for the specified windlass ratings.
- Chain stopper foundation drawings ~~inclusive of~~ including the supporting structure below deck. The details shall include bolts, chocks, shear stoppers etc., along with the foot print loads for the specified rating.
- Windlass arrangement plans showing all the components of the anchoring/mooring system such as the prime mover, shafting, cable lifter, anchors and chain cables; mooring winches, wires and fairleads, if they form part of the windlass machinery~~;~~, brakes~~;~~, controls~~;~~, etc.
- Dimensions, materials, welding details, as applicable, of all torque-transmitting components (shafts, gears, clutches, couplings, coupling bolts, etc.) and all load-bearing components (shaft bearings, cable lifter, sheaves, drums, bed-frames, etc.) ~~components~~ of the windlass and of the winch, where applicable, including brakes, chain stopper (if fitted), and foundation.
- Hydraulic system, to include:
  - (a) piping diagram along with system design pressure~~,~~;
  - (b) safety valves arrangement and settings~~,~~;
  - (c) material specifications for pipes and equipment~~,~~;
  - (d) typical pipe joints, as applicable~~, and~~ ;
  - (e) technical data and details for hydraulic motors~~.~~;
  - (f) cooling systems arrangements for hydraulic system oil.

8.3 Materials and fabrication

8.3.1 Materials used in the construction of torque-transmitting and load-bearing parts of windlasses are to comply with LR's *Rules for the Manufacture, Testing and Certification of Materials, July 2018* or an appropriate National or International Standard acceptable to LR, provided that the Standard gives reasonable equivalence to the requirements of LR. The proposed materials are to be indicated in the construction plans and are to be approved in connection with the design. All such materials are to be certified by the material manufacturers and are to be traceable to the manufacturers' certificates.

8.4 Windlass design

8.4.1 In addition to the requirements of the National or International Standard or code of practice acceptable to LR (*see Vol 1, Pt 3, Ch 5, 8.1 General 8.1.2*) the following performance requirements are to be complied with:

(c) Continuous Duty Pull: The windlass is to have sufficient power to exert a continuous duty pull, $Z_{\text{cont1,}}$ over a period of 30 minutes corresponding to the grade and diameter, d_c, of the chain cables as follows:

The anchor masses are assumed to be the masses as given in *Table 5.6.1 Equipment - Kedge anchors and wires, towlines and mooring lines*. The value of Z_{cont} is based on the hoisting of one anchor at a time, and ~~also~~ assumes that the effects of buoyancy and hawse pipe efficiency (assumed to be 70 per cent) have been accounted for. In general, stresses in each torque-transmitting component are not to exceed 40 per cent of yield strength (or 0,2 per cent proof stress) of the material under these loading conditions.

8.4.4 The following criteria are to be used for gearing design:
Gears intended to transmit power greater than 100 kW are to be certified by LR, and the gears are to meet the requirements of *Vol 2, Pt 3 Ch 1 Gearing*.

8.6 Hydraulic systems

8.6.1 Hydraulic systems, where employed for driving windlasses, are to comply with the requirements of *Vol 2, Pt 7, Ch 5, 11 Hydraulic power actuating systems.*

8.9 Protection arrangements

8.9.8 The design of the windlass is to be such that the following requirements or equivalent arrangements will minimise the probability of the chain locker or forecastle being flooded in bad weather:

(a) a weathertight connection can be made between the windlass bedplate, or its equivalent, and the upper end of the chain pipe by means of a cover or seal~~.~~ , and

8.10 Shop inspection and testing

8.10.1 Windlasses are to be inspected during fabrication at the manufacturers' facilities by a Surveyor for conformance with the approved plans. Acceptance tests, as specified in the specified Standard (*see Vol 1, Pt 3, Ch 5, 8.1 General 8.1.2*), are to be witnessed by the Surveyor and include the following tests, as a minimum:

(b) Load test. The windlass is to be tested to verify that the continuous duty pull, overload capacity and hoisting speed as specified in *Vol 1, Pt 3, Ch 5, 8.4 Windlass design 8.4.1* can be achieved.

Where the ~~manufacturing~~ manufacturer's works does not have adequate facilities, these tests, including the adjustment of the overload protection, can be carried out on board ship. In these cases, functional testing in the manufacturer's works is to be performed under no-load conditions.

Volume 1, Part 5, Chapter 3
Local Design Loads

■ *Section 4*

Impact loads on external plating

4.2 Bottom impact pressure, *IP*bi

4.2.1 The bottom impact pressure due to slamming, IP_{bi}, is to be derived using the method given below. This method will produce impact pressures over the whole of the underwater plating region:

V_{bs} = slamming velocity, in m/s, and is given by

~~$\sqrt{V_{\mathrm{th}\,2} + 2\mathrm{m}_1\,\mathrm{In}\,(\mathrm{N}_{\mathrm{si}})}$ for $N_{\mathrm{s1}} \geq 1$~~ $\sqrt{V_{\mathrm{th}}{}^{2} + 2\mathrm{m}_1\,\mathrm{iN}\,(\mathrm{N}_{\mathrm{si}})}$ for $N_{\mathrm{s1}} \geq 1$

4.3 Bow flare and wave impact pressures, *IP*bf

4.3.1 This Section is applicable to:

(a) Bow flare region.
(b) Sides and undersides of sponsons.
(c) Other parts of the side shell plating close to and above the design waterline that are expected to be subjected to wave impact pressures.

The bow flare wave impact pressure, wave impact pressure on sponsons and other parts of the side shell plating above the design waterline, IP_{bf}, in kN/m^2, due to relative motion is to be taken as:

V_{bf} = wave impact velocity, in m/s, and is given by

~~$\sqrt{V_{\mathrm{thbf}\,2} + 2\mathrm{m}_{\mathrm{I}}\,\mathrm{In}\,(N_{\mathrm{bf}})}$ for $N_{\mathrm{bf}} \geq 1$~~ $\sqrt{V_{\mathrm{th}}{}^{2} + 2\mathrm{m}_{\mathrm{I}}\,\mathrm{iN}\,(\mathrm{N}_{\mathrm{bf}})}$ for $N_{\mathrm{bf}} \geq 1$

Volume 2, Part 2, Chapter 1
Reciprocating Internal Combustion Engines

■ *Section 3*
Crankshaft design

3.2 Scope

3.2.9 Further information and guidance ~~for~~ on crankshaft design is provided in ~~the~~ LR's ~~*Guidance Notes for Crankshaft SCF Calculation using Finite Element Method* and *Guidance for the Evaluation of Crankshaft Fatigue Tests*~~ *Guidance Notes for the Calculation of Stress Concentration Factors, Fatigue Enhancement Methods and Evaluation of Fatigue Tests.*

■ *Section 7*
Control and monitoring of main, auxiliary and emergency engines

7.3 Auxiliary engine governors

7.3.2 If an engine cannot achieve the requirements of *Vol 2, Pt 2, Ch 1, 7.3 Auxiliary engine governors 7.3.1* then the actual load step is to be declared and verified through testing to ensure that the requirements specified in *Vol 2, Pt 9, Ch 1, 2.1 Quality of power supplies (QPS)* are satisfied. In cases where a step load equivalent to the rated output of a generator is switched off, a transient speed variation in excess of 10 per cent of the rated speed is acceptable, provided that this does not cause the intervention of the overspeed device as required by *Vol 2, Pt 2, Ch 1, 7.5 Overspeed protective devices 7.5.1*.

Volume 2, Part 9, Chapter 2
Electrical Power Generator and Energy Storage

Scope

Application of this Chapter will facilitate the verification of the performance requirements of *ANEP-77, NATO Naval Ship Code*, Chapter IV, Regulation ~~9~~ 10.

Volume 2, Part 9, Chapter 3
Electrical Power Distribution and Equipment

Scope

Application of this Chapter will facilitate the verification of the performance requirements of *ANEP-77, NATO Naval Ship Code*, Chapter IV, Regulation ~~10~~ 13.

Volume 2, Part 9, Chapter 4
Electrical Protection

Scope

Application of this Chapter will facilitate the verification of the performance requirements of *ANEP-77, NATO Naval Ship Code*, Chapter IV, Regulation ~~10~~ 15.

Volume 2, Part 9, Chapter 6
Lighting

Scope

Application of this Chapter will facilitate the verification of the performance requirements of *ANEP-77, NATO Naval Ship Code*, Chapter IV, Regulations ~~11~~ 14 and Chapter VII, Regulation 15.

Volume 2, Part 9, Chapter 7
Control, Alerts and Safety Systems

Scope

Application of this Chapter will facilitate the verification of the performance requirements of *ANEP-77, NATO Naval Ship Code*, Chapter IV, Regulations ~~13, 14 and 15~~ 16, 17 and 18.

Volume 2, Part 9, Chapter 8
Programmable Electronic Systems

Scope

Application of this Chapter will facilitate the verification of the performance requirements of *ANEP-77, NATO Naval Ship Code*, Chapter IV, Regulation ~~15~~ 18.

Volume 2, Part 10, Chapter 1
Ergonomics

■ *Section 1*
Scope

1.3 Application of this Chapter will facilitate the verification of the functional objectives and performance requirements of *ANEP-77, NATO Naval Ship Code*, Chapter IV, Regulation ~~17~~ 20.

Volume 3, Part 3, Chapter 2
Environmental Protection

▪ *Section 2*
ENV characters

2.8 Refrigeration systems, RS character

2.8.15 All personnel involved in the following activities must be suitably experienced or possess an applicable qualification:

(a) installation, servicing or maintenance of the refrigeration equipment covered by the **~~ECO~~** **ENV** Notation;

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